REMARKS

Claim 1 is amended to more particularly point out that the polymeric encapsulant is a molded body overlying the rear face of the integrated circuit die, a feature previously recited in claim 2, now cancelled.

Claim Rejection based upon Chason et al.

Claims 1, 3-6, and 8 were rejected under 35 U.S.C. § 102(e) as anticipated by United States Patent No. 6,800,946, issued to Chason et al. in 2004.

Chason et al. describes a flip-chip assembly that includes an underfill material 240 between the flip chip 210 and a printed wiring board 230, see Fig. 2. It is significant that Chason et al. refers to the encapsulant as "selective underfill material," col. 6, line 36. Referring to Fig. 3, underfill material 340 is applied to the flip chip prior to assembly. In this manner, the underfill material is applied only to selected regions and not onto portions 260. In contrast, Applicants' assembly comprises an overmolded polymeric body that both covers the rear face of the die and extends into the gap to protect the interconnections. Chason et al. does not show an overmolded assembly and, because the encapsulant is pre-applied, is not suited for forming an overmolded assembly. Thus, Chason et al. does not anticipate, or even suggest Applicants' assembly.

Claim 1 is directed to Applicants' assembly that includes an optical window

defined by an encapsulant within a gap between the central region of an integrated circuit die and a substrate. The encapsulant is a molded body that overlies the rear face of the die. Chason et al. does not show an overmolded assembly, and so does not teach or suggest an overmolded assembly having an optical window in accordance with claim 1.

Claims 3-6 and 8 dependent upon claim 1 and are not taught or suggested by Chason et al. at least for the reasons set forth with regard to that claim.

Accordingly, it is respectfully requested that the rejection of the claims based upon Chason et al. be reconsidered and withdrawn, and that the claims be allowed.

Claim Rejection based upon Glen et al. and Chason et al.

Claims 1-6, and 8-9 were rejected under 35 U.S.C. § 103 as unpatentable over United States Patent No. 6,571,466, issued to Glenn et al. in 2003, in view of Chason.

Glenn et al. describes sensor package that includes a cavity 118 between a sensor 104 and a substrate 102, see Fig. 2, and col. 10, lines 50-53. The package comprises a bead 116 that extends about the periphery of sensor 104, col. 10, lines 23-30. Whereas Glenn et al. discloses a bead, the encapsulant in Applicants' assembly is formed of a molded body. The rejection points to Fig. 4. Fig. 4 shows a step up ring 402 disposed about the sensor 104 and formed of ceramic, printed circuit board material or electrically insulative tape, col. 13, lines 40-43. The step up ring is formed apart from the sensor 104

and not overmolded about the sensor. The rejection also points to col. 10, lines 47-48, that the bead may contact the upper surface 104U of the sensor. A glob of material dispensed to form the bead might indeed result in the bead overlying the upper surface. However, nothing in Glenn et al. shows an overmolding process to encapsulate the die within a polymeric body. Indeed, Fig. 4, as well as other embodiments in Glenn et al., have features that would interfere with overmolding. Thus, Glenn et al. does not teach or suggest Applicants' invention.

Nor does Chason et al. make up the deficiencies. As discussed herein, Chason et al. shows material that is pre-applied to the flip chip and not overmolded. Thus, even if the references are combined, they do not point to the overmolded assembly that is Applicants' invention.

Claim 1 is directed to Applicants' assembly that includes an optical window defined by a polymeric encapsulant that is a molded body and that overlies the rear face of the die. The encapsulant in Glenn et al. is a bead, whereas the encapsulant in Chason et al. is a pre-applied layer limited to the active face of the chip. Thus, the references do not teach or suggest Applicants' assembly in claim 1, or in claims 3-6 and 8.

Claim 9 is directed to Applicants' preferred assembly and calls for overmolded polymer encapsulant overlying the rear face of the die and defining the optical window. For the reasons herein, the references do not show the assembly in claim 9.

Accordingly, it is respectfully requested that the rejection of the claims based upon Glenn et al. and Chason et al. be reconsidered and withdrawn, and that the claims be allowed.

Claim Rejection based upon Glen et al., Chason et al. and Gonzalez et al.

Claim 7 was rejected under 35 U.S.C. § 103 as unpatentable over Chason et al. in view of United States Patent Application Publication 2003/0080437, by Gonzalez et al. Also, claim 7 was rejected under 35 U.S.C. § 103 as unpatentable over Glenn et al. and Chason et al. in view of Gonzalez et al.

Claim 7 is dependent upon claim 1. For the reasons discussed above, Chason et al. shows pre-applied encapsulant, whereas Glenn et al. shows an encapsulant bead. Thus, neither shows a molded encapsulant body, a key feature of Applicants' invention.

Gonzalez et al. describes an encapsulant having a CTE within a preferred range for Applicants' invention. However, Gonzalez et al. does not disclose an overmolded assembly. Moreover, Gonzalez et al. does not show a window formed by the encapsulant. Without these features, Gonzalez et al. does not suggest that the flow of material can be limited during an overmolding process to define a window. Accordingly, even if the material is suitable as a pre-applied layer as in Chason, or as a bead as in Glenn et al., there is nothing in the references to point the practitioner to overmolding encapsulant to define a window, as set forth in claim 1 and included in claim 7.

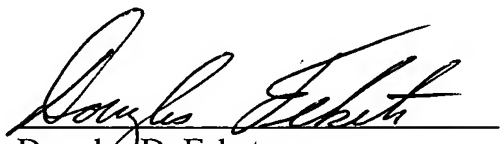
Accordingly, it is respectfully requested that the rejection of claim 7 based upon Glenn et al., Chason et al. and Gonzalez et al. be reconsidered and withdrawn, and that the claims be allowed.

Conclusion

It is believed, in view of the amendments and remarks herein, that all grounds of rejection of the claims have been addressed and overcome, and that all claims are in condition for allowance. If it would further prosecution of the application, the Examiner is urged to contact the undersigned at the phone number provided.

The Commissioner is hereby authorized to charge any fees associated with this communication to Deposit Account No. 50-0831.

Respectfully submitted,



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